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JOINT.

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## A NEW INCISION FOR ARTHRECTOMY, RESECTION, AND FOR REDUCTION OF IRREDUCIBLE DISLO- CATION OF THE SHOULDER-JOINT.

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THE modern operations for tuberculosis of joints requiring arthrectomy or resection are characterized by thorough removal of the diseased tissue through incisions which afford free access to the joint, and that do not inflict unnecessary damage to important muscles, vessels and nerves. The ultimate success of such operations depends largely upon the thoroughness with which they are performed, the care exercised in the preservation of healthy tissue, and the prevention of injury to important structures involved at the site of operation. The incisions which are being devised for resection of the different joints have these two objects in view, and the recent improvements in the surgery of joints are largely due to a more perfect technic in performing the operations. The success that has attended the open method in the reduction of irreducible dislocations has added a new impulse to this department of surgery. Attempts to reduce old dislocations of the shoulder-joint have, in the hands of the most careful and competent surgeons, frequently terminated in disaster, so that the surgeon of to-day has learned caution, and is more inclined to remove the obstacles to reduction by a safe and clean dissection than by brute force.

The object of this paper is to describe a new incision

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for exposing the shoulder-joint for different indications, but before doing so it may be of interest to mention the many different incisions which have been devised from the time the first excision of the shoulder-joint was made until the present time. A retrospective view of this kind is of interest in showing what progress surgery has made during the present century.

Boucher removed parts of the shoulder-joint for gunshot wounds in 1753, and Thomas opened the joint for the extraction of necrosed bone in 1740. The first authenticated case of resection of the shoulder-joint was performed by Ch. White and not by Bent, as stated by Treves in his work on "Operative Surgery," vol. i, p. 647. White (*Cases of Surgery*, vol. i,) performed the operation in 1768; Bent, of Newcastle, in 1771, three years later. White's patient was a boy of 14, who was the subject of acute suppurative inflammation of the shoulder-joint, terminating in the formation of an extensive abscess, which had discharged itself externally. The description of the operation, given by Mr. White himself, is interesting:

"I began my incision at that orifice, which was situated just below the processus acromion, and carried it down to the middle of the humerus, by which all the subjacent bone was brought into view, then took hold of the patient's elbow and easily forced the upper head of the humerus out of its socket, and brought it so entirely out of the wound, that I readily grasped the whole head in my left hand, and held it there till I had sawn it off with a common amputation saw, having first applied a pasteboard card betwixt the bone and the skin. I had taken the precaution of placing an assistant, on whom I could depend, with a compress just above the clavicle, to stop the circulation in the artery, if I should have the misfortune to cut or lacerate it; but no accident of any kind happened, and the patient did not lose more than two ounces of blood; only a small artery, which partly surrounds the joint, being wounded, which was easily secured."

The patient made a good recovery, and four months later left the infirmary completely cured, the functional result being excellent. Sequestration of the sawed sur-

face of the humerus delayed the healing of the wound. Mr. White's example was followed by Bent in 1771 and by Mr. Orred, of Chester, in 1778. It appears, from the accounts we have of these operations, that the disease for which they were performed was really caries of the shoulder-joint, and that the patients retained limbs which, if not perfect, were at least extremely useful. Notwithstanding this encouragement to extend the practice, it seems to have been afterward treated in England with entire neglect.

In France, Moreau the elder performed the operation successfully in 1786, and the army surgeons, particularly Banus, Percy, and Larrey, frequently resorted to it on account of recent gunshot wounds, instead of removing the limb. In Scotland the operation was revived by Mr. Syme in 1820, and was later performed by Babington, Liston, Baddely, Fergusson, Lawrence, Hunt, Coote, Hutchinson, Erichsen, Birkett, Stubbs, Blackman, and others. In Germany the first resection of the shoulder-joint was made by Lentin in 1771, and he was followed by Wutzer, Fricke, Jäger, Blasius, Textor, Dietz, Heyfelder, Langenbeck, Esmarch, Wilms, and Bartels.

The variety of incisions that have been devised for exposing the shoulder-joint with a view of resecting the head of the humerus is something remarkable. White's original incision was a straight one, extending from the acromion process downward through the center of the deltoid muscle. The same incision was practised by Virgarrus. The incisions of Larrey, Kern, Chassaignac, and Jäger are only slight modifications of White's incision. Baudens commenced his incision just below the coracoid process of the scapula and carried the knife along the groove between the pectoralis major and deltoid muscles to the groove for the biceps muscle. If this incision did not afford the necessary room for the



removal of the diseased head of the humerus, he enlarged the wound by making two small transverse cuts (but only through the muscles), in a forward direction at each end of the vertical incision. Langenbeck's incision extends from the anterior border of the acromion process near the clavicular junction in a vertical direction downward through the deltoid muscle and is the incision that has usually been selected for resection of the shoulder-joint. Baudens' incision was somewhat modified by Malgaigne and Robert. Frank and Ried joined the upper end of the anterior vertical incision by a short transverse cut extending beneath the acromion process. Bouzairies joined two oblique incisions in the figure of the letter V, making a flap including the deltoid muscle with its base directed upward. Bent made a long incision from the joint downward in the furrow between the pectoralis major and deltoid muscles; and as this did not afford enough room, he made two short transverse cuts, one meeting the upper end of the long cut dividing the clavicular attachment of the deltoid muscle, the lower the humeral insertion of the pectoralis major, making thus a quadrangular flap with its base directed toward the body. Bell, Morel, and Guepratte made a semilunar incision with its base directed upward. Wattmann carried the knife from the posterior margin of the acromion process along the border of the deltoid to its insertion, and joined it by another incision extending from the tip of the coracoid process to the same point, making in this way a triangular flap which included the deltoid muscle. Sabatier's flap-incisions are the same, only the space included by the incision is smaller. The elder Moreau made a quadrangular flap with its base directed downward, while a similar flap, with its base in an opposite direction, was advised by Manne, Percy, the younger Moreau, Textor, and Jäger. Syme made a perpendicu-

lar incision from the acromion through the middle of the deltoid, nearly to its point of insertion, and then another one upward and backward, from the lower extremity of the former, so as to divide the external part of the muscle.

"The flap thus formed being dissected off, the joint will be brought into view, and the capsular ligament, if still remaining, having been divided, the finger of the surgeon may be passed around the head of the bone, so as to feel the attachments of the spinati and scapular muscles, which can then be readily divided by introducing the scalpel first on the one side and then on the other. After this, the elbow being pulled across the fore part of the chest, the head of the humerus will be protruded, and may then be easily sawed off, while grasped in the operator's left hand."

Albanese makes a posterior incision in the shape of an inverted L, commencing at the spine of the scapula, at the junction of this with the acromion process, extending from above downward and forward to the head of the humerus, from where it is directed forward, terminating at the tuberculum majus. The muscles are separated with the periosteum, and through the wound the head of the humerus is removed. It is claimed that this incision has the advantage over other posterior incisions that it does not endanger the circumflex nerve. Ollier's incision extends from the outer border of the coracoid process of the scapula in the direction of the fibers of the deltoid muscle obliquely outward and downward, a distance of four or five inches, to the shaft of the humerus, and is called the anterior oblique incision. Kocher's posterior curved incision is commenced over the acromio-clavicular joint, extends over the shoulder-joint to the middle of the crista scapulæ, and is continued in a curved direction downward to the posterior fold of the axillary space. In Kocher's operation the acromion process is temporarily detached to furnish better access to the joint. Bardenheuer's in-



cision passes directly over the acromion process, which is divided in the same line and temporarily detached.

The incision that I have devised has this great advantage over Bardenheuer's that the scar resulting from the operation is well protected by the prominence formed by the shoulder-joint, and at the



Fig. 1.—External semilunar incision exposing the deltoid muscle.

same time secures free access to every part of the shoulder-joint and its immediate vicinity. The external incision is made so as to form an oval cutaneous flap, which is turned upward, exposing the upper half of the deltoid muscle. It is commenced over the coracoid process, and is carried downward and outward in a gentle curve as far as the middle of the



deltoid muscle, when it is continued in a similar curve upward and backward as far as the posterior border of the axillary space on the same level where it was commenced, that is, a point opposite the coracoid. The semilunar flap is next dissected up as far as the base of the acromion process and reflected. The acromion process is detached with a saw, and turned downward, with the deltoid muscle attached (Fig. 2). The capsule

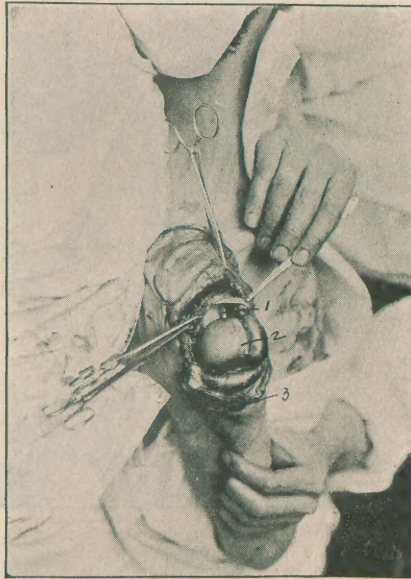


Fig. 2.—Exposure of shoulder-joint after temporary detachment of acromion process which with the attached deltoid is turned inward. (1) Glenoid cavity. (2) Head of humerus. (3) Acromion process.

of the joint is now freely exposed. If the operation is performed for an irreducible dislocation of the shoulder-joint, the head of the humerus can now be located, the cause of resistance to reduction is sought for and removed, or corrected when the reduction can be accom-

plished by direct means, or by direct measures and manipulation. If the operation has for its object the removal of diseased tissue, the capsule is opened and the interior of the joint subjected to a careful examination, to determine the extent of the operation. If the disease is limited to the soft structures, a complete ar-

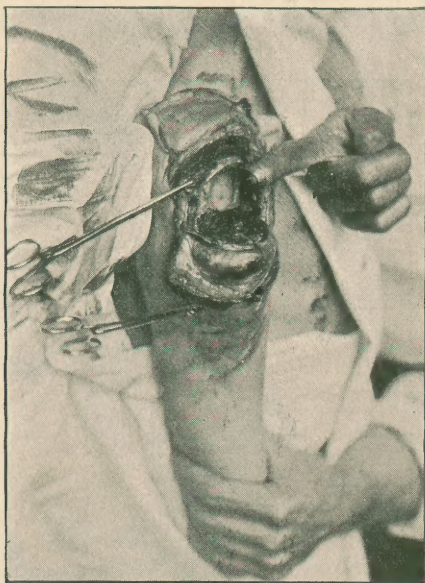


Fig. 3.—Free exposure of glenoid cavity and capsule of joint after resection of head of humerus.

threctomy can be performed without sacrificing any portion of the bony constituents of the joint by dislocating the head of the humerus in different directions for the purpose of rendering the entire capsule accessible to the dissecting forceps, knife, and scissors. If the head of the humerus is sufficiently diseased to indicate a typical resection, it should be removed as a preliminary step to the subsequent arthrectomy. The glenoid



cavity is readily accessible, and should be dealt with in accordance with the pathologic conditions present. After the removal of all diseased tissue, and proper preparation of the wound, the acromion process is replaced and

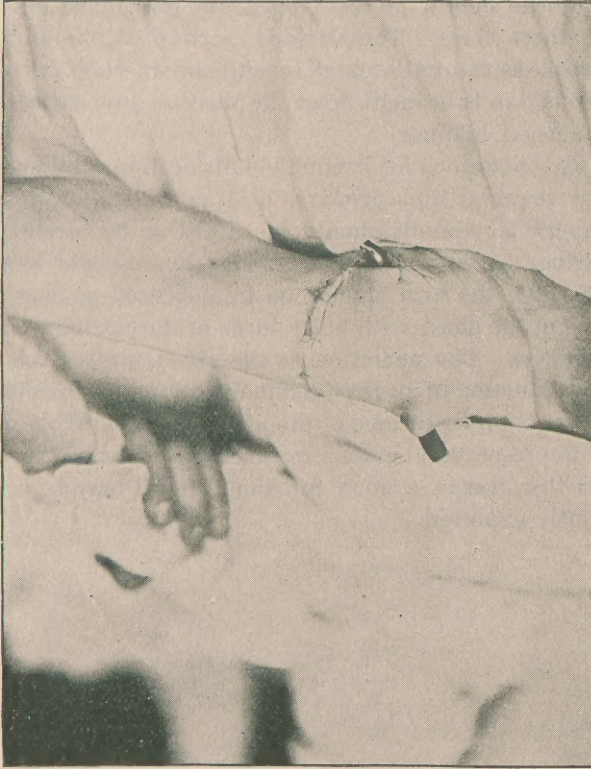


Fig. 4.—Operation completed. Cutaneous flap sutured. Through-tubular drainage.

held in position by two or three strong catgut sutures. Silver wire is seldom required in suturing a temporarily detached bony prominence in operations upon the different joints. The catgut sutures hold the fragment

long enough in place for bony union to occur. I very rarely drill the bone-ends, as the sutures gain a sufficiently strong hold by including the periosteum and the paraperiosteal structures. In operating upon the shoulder-joint for disease, through-tubular or capillary drainage should be established and continued for two or three days. The divided portion of the deltoid muscle is sutured separately with catgut, when the cutaneous flap is brought down in position and sutured in the usual manner.

In operations for irreducible dislocation, drainage is not required and primary healing of the deep and superficial wounds should be aimed at by careful suturing. After applying a copious hygroscopic aseptic dressing, the arm should be immobilized against the side of the chest with a few turns of the plaster-of-Paris bandage. The operation as described, undertaken for the reduction of an irreducible dislocation, arthrectomy or resection for disease of the joint, does not involve any of the important tendons, muscles, vessels or nerves, and for this reason a good functional result may be confidently expected.







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